

CLAIM 1. An electrochemical cell, comprising:

a first electrode;

a second electrode;

a membrane disposed between the first electrode and the second electrode;

5 and

a pressure pad disposed in electrical communication with the first

electrode and being configured to support the first electrode, the second electrode, and

the membrane, the pressure pad comprising,

an electrically conductive member, and

10 a compression member disposed at the electrically conductive member.

CLAIM 2. The electrochemical cell of claim 1 wherein the electrically conductive member and the compression member are continuous structures concentrically arranged to form the pressure pad.

CLAIM 3. The electrochemical cell of claim 1 wherein the electrically conductive

member and the compression member are spirally arranged to form the pressure pad.

CLAIM 4. The electrochemical cell of claim 1 wherein the electrically conductive member comprises a plate, the plate being configured to include plurality of raised portions concentrically disposed thereon, the raised portions being configured to receive compression members therebetween.

CLAIM 5. The electrochemical cell of claim 1 wherein the compression member is longitudinally disposed within the electrically conductive member.

CLAIM 6. The electrochemical cell of claim 1 wherein the electrically conductive member is compressible.

CLAIM 7. The electrochemical cell of claim 1 wherein the pressure pad is porous.

CLAIM 8. The electrochemical cell of claim 1 wherein the electrically conductive member is fabricated from a material selected from the group consisting of copper, silver, gold, aluminum, niobium, zirconium, tantalum, titanium, iron, nickel, cobalt, hafnium, tungsten, alloys of the foregoing materials, superalloys of the foregoing materials, 5 electrically conductive polymers, and combinations of the foregoing materials.

CLAIM 9. The electrochemical cell of claim 1 wherein the electrically conductive member is fabricated of electrically conductive carbon.

CLAIM 10. The electrochemical cell of claim 1 wherein the compression member is fabricated from an elastomeric material.

CLAIM 11. The electrochemical cell of claim 10 wherein the elastomeric material is selected from the group consisting of silicones, fluorosilicones, fluoroelastomers, and combinations of the foregoing materials.

CLAIM 12. A pressure pad for an electrochemical cell, the pressure pad comprising:
an electrically conductive member, and
a compression member disposed adjacent to the electrically conductive member.

CLAIM 13. The pressure pad of claim 12 wherein the electrically conductive member and the compression member are concentrically arranged relative to each other.

CLAIM 14. The pressure pad of claim 12 wherein the electrically conductive member and the compression member are spirally arranged to form the pressure pad.

CLAIM 15. The pressure pad of claim 12 wherein the compression member is of a height that is greater than a height of the electrically conductive member, the compression member being compressible to a height equal to the height of the electrically conductive member upon pressurization of the electrochemical cell.

CLAIM 16. The pressure pad of claim 12 wherein the electrically conductive member comprises a plate, the plate being configured to include plurality of raised portions concentrically disposed thereon, the raised portions being configured to receive the compression member therebetween.

CLAIM 17. The pressure pad of claim 16 wherein the raised portions are concentrically disposed on a first major surface of the plate and on an opposing second major surface of the plate.

CLAIM 18. The pressure pad of claim 17 wherein the raised portions concentrically disposed on the first major surface of the plate register with spaces between the raised portions concentrically disposed on the second major surface of the plate.

CLAIM 19. The pressure pad of claim 16 wherein the plate includes an interruption extending radially outward from a hub disposed substantially at a center of the plate, the interruption being configured to provide a flexibility to the plate.

CLAIM 20. The pressure pad of claim 12 wherein the compression member includes a groove disposed therein, the groove being configured, positioned, and dimensioned to facilitate the radial expansion of the compression member upon a pressure being applied to the compression member.

CLAIM 21. A pressure pad for an electrochemical cell, the pressure pad comprising:

an electrically conductive member, and

a compression member longitudinally disposed within the electrically conductive member.

CLAIM 22. The pressure pad of claim 21 wherein the compression member is longitudinally disposed within the electrically conductive member such that a longitudinal axis of the electrically conductive member and a longitudinal axis of the compression member coincide.

CLAIM 23. The pressure pad of claim 22 wherein the compression member is longitudinally disposed within the electrically conductive member such that a longitudinal axis of the electrically conductive member and a longitudinal axis of the compression member are parallel and non-coincident.

CLAIM 24. The pressure pad of claim 21 wherein the electrically conductive member and the compression member are positioned to define a concentric arrangement over a major surface of the pressure pad.

CLAIM 25. The pressure pad of claim 21 wherein the electrically conductive member and the compression member are positioned to define a spiral arrangement over a major surface of the pressure pad.

CLAIM 26. A method of maintaining compression within an electrochemical cell, the method comprising:

disposing an electrically conductive member and a compression member at an electrode;

5 applying a load at the cell to compress the cell components; and

maintaining electrical communication between the electrode and an external load through the electrically conductive member.

CLAIM 27. A method of maintaining compression within an electrochemical cell, the method comprising:

disposing a compressible electrically conductive member at an electrode;

applying a load at the cell to compress the cell components; and

5 maintaining electrical communication between the electrode and an external load through the electrically conductive member.

CLAIM 28. A method of forming a pressure pad for an electrochemical cell, the method comprising:

disposing a first electrically conductive member at a first compression member to form a first ring assembly;

5 disposing a second electrically conductive member at a second

compression member to form a second ring assembly; and

arranging the first ring assembly at the second ring assembly in a concentric pattern.

CLAIM 29. The method of claim 28 wherein the first compression member and the second compression member are dimensioned to correlate to a desired compression of the pressure pad.

CLAIM 30. The method of claim 28 wherein the disposing of the first electrically conductive member at the first compression member comprises longitudinally disposing the first compression member within the first electrically conductive member.

CLAIM 31. A method of forming a pressure pad for an electrochemical cell, the method comprising:

disposing an electrically conductive member at a compression member;
and
5 arranging the electrically conductive member and the compression member in a spiral pattern.

CLAIM 32. The method of claim 31 wherein the disposing of the electrically conductive member at the compression member comprises longitudinally disposing the compression member within the electrically conductive member.

CLAIM 33. A method of forming a pressure pad for an electrochemical cell, the method comprising:

forming a plate of electrically conductive material; and
disposing a compression member at the plate.

CLAIM 34. The method of claim 33 wherein the plate is formed by an operation selected from the group consisting of stamping, casting, and machining.

CLAIM 35. The method of claim 33 wherein the disposing of the compression member at the plate comprises molding the compression member at the plate.

CLAIM 36. The method of claim 33 wherein the disposing of the compression member at the plate comprises adhesively bonding the compression member to the plate.

CLAIM 37. The method of claim 33 further comprising disposing grooves in the compression member.

CLAIM 38. The method of claim 33 further comprising disposing an interruption in the plate, the interruption being configured to extend from a central portion of the plate to an outer edge of the plate.

CLAIM 39. A method of forming a pressure pad for an electrochemical cell, the method comprising: disposing a compressible electrically conductive member on a support member.

CLAIM 40. The method of claim 39 further comprising disposing partition members adjacent the compressible electrically conductive member.

CLAIM 41. A pressure pad for an electrochemical cell, the pressure pad comprising:
an electrically conductive member interwoven with a compression
member.

CLAIM 42. A pressure pad for an electrochemical cell, the pressure pad comprising:
an electrically conductive member inter-stitched with a compression
member.